This listing of claims will replace all prior versions and listings of claim in the application:

Listing of the Claims:

45. (new) A laser comprising:

a laser-resonator including an output coupling mirror;

an OPS-structure having a surface-emitting gain-structure, said gain-structure including a plurality of active layers having separator layers therebetween said active layers having a composition selected to provide emission of electromagnetic radiation at a fundamental wavelength within a gain bandwidth of said gain-structure, when optical-pump light is incident on said gain-structure;

said OPS structure being supported on a substrate located outside said laser-resonator with said gain-structure of said OPS-structure being inside said laser resonator;

a heat-sink arrangement for cooling said OPS-structure; and

an optical arrangement for delivering said pump-light to said gain-structure, thereby causing fundamental laser-radiation having said fundamental-wavelength to oscillate in said laser-resonator; and

an optically-nonlinear crystal located in said laser-resonator and arranged for frequency-doubling said fundamental laser-radiation thereby providing frequency-doubled radiation having a wavelength half of said fundamental-wavelength, with the frequency-doubled radiation exiting the cavity through the output coupling mirror is greater than about 100mw.

46. (new) The laser of claim 45, wherein said pump light is directed to said gain structure at a non-normal angle of incidence.

47. (new) The laser of claim 45, wherein said output coupler is has a concave surface.

48. (new) The laser of claim 45, wherein the radiation exiting the cavity has a mode quality of better than 2.0.

49. (new) The laser of claim 45, wherein the radiation exiting the cavity has a mode quality of about 1.2.

50. (new) The laser of claim 45, further including a wavelength selective element in the resonator.

51. (new) The laser of claim 50, wherein said wavelength selective element is a birefringent filter.

52. (new) The laser of claim 45, wherein said OPS structure includes a mirror structure surmounted by said gain-structure and said mirror structure is said first mirror.

53. (new) A laser, comprising:

a laser-resonator having a resonator axis and being terminated by first and second mirrors;

an OPS-structure having a surface-emitting gain-structure, said gain-structure including a plurality of active layers having separator layers therebetween said active layers having a composition $In_x Ga_{1-x} N$ where $0.0 \leq x \leq 1.0$, said composition selected to provide emission of electromagnetic radiation at a fundamental wavelength within a gain bandwidth of said gain-structure characteristic of said composition, when optical-pump light is incident on said gain-structure;

said OPS structure being supported on a substrate located outside said laser-resonator with said gain-structure of said OPS-structure being inside said laser resonator;

an optical arrangement for delivering said pump-light to said gain-structure, thereby causing fundamental laser-radiation having said fundamental-wavelength to oscillate in said laser-resonator; and wherein one of said first and second mirrors is partially transmissive for delivering said laser radiation from said laser resonator.

54. (new) The laser of claim 53, wherein the radiation exiting the cavity has a mode quality of better than 2.0.

55. (new) The laser of claim 53, wherein the radiation exiting the cavity has a mode quality of about 1.2.

56. (new) The laser of claim 45, further including a wavelength selective element in the resonator.

57. (new) The laser of claim 56, wherein said wavelength selective element is a birefringent filter.

58. (new) The laser of claim 53, wherein said OPS structure includes a mirror structure surmounted by said gain-structure and said mirror structure is said first mirror.

59. (new) A laser, comprising:

a laser-resonator formed by at least two mirrors;

an OPS-structure having a surface-emitting gain-structure, said gain-structure including a plurality of active layers having separator layers therebetween said active layers having a composition selected to provide emission of electromagnetic radiation at a predetermined fundamental-wavelength when optical-pump light is incident on said gain-structure;

said laser-resonator configured to include said gain-structure of said OPS-structure;

an optical arrangement for delivering said pump-light to said gain-structure, thereby causing fundamental laser-radiation having said fundamental-wavelength to circulate in said laser-resonator;

a heat-sink arrangement for cooling said OPS-structure; and

said laser-resonator, said OPS-structure, said heat-sink arrangement and said optical pump-light-delivering arrangement selected and arranged such that said resonator delivers output-radiation having said fundamental-wavelength at a power greater than 2 W.

60. (new) The laser of claim 59, wherein said resonator is formed by three mirrors.

61. (new) A laser, comprising:

a first OPS-structure having a gain-structure surmounting a mirror-structure, said gain-structure including a plurality of active layers having pump-light-absorbing layers therebetween, said active layers having a composition selected to provide emission of electromagnetic radiation at a predetermined fundamental-wavelength between about 425 nanometers and 1800 nanometers when optical-pump light is incident on said gain-structure;

a laser-resonator formed by said mirror-structure of said first OPS-structure and at least two other reflectors;

an optical arrangement for delivering said pump-light to said gain-structure, thereby causing fundamental laser-radiation having said fundamental-wavelength to circulate in said laser-resonator;

a heat-sink arrangement for cooling said first OPS-structure;

an optically-nonlinear crystal located in said laser-resonator and arranged for frequency-doubling said fundamental laser-radiation thereby providing frequency-doubled radiation having a wavelength half of said fundamental-wavelength; and

said laser-resonator, said optically nonlinear-crystal, said OPS-structure, said heat-sink arrangement and said optical pump-light-delivering arrangement selected and arranged such that said resonator delivers said frequency-doubled radiation as output-radiation having a wavelength between about 212 nanometers and 900 nanometers.

62. (new) The laser of claim 61, wherein said laser resonator is formed by said mirror-structure of said first OPS structure and three other reflectors.

63. (new) The laser of claim 62, further including a second OPS-structure having a gain-structure surmounting a mirror-structure, and wherein said mirror structure of said second OPS-structure is one of said three other reflectors.

64. (new) A laser, comprising:

an OPS-structure having a gain-structure surmounting a mirror-structure, said gain-structure including a plurality of active layers having pump-light-absorbing layers therebetween, said active layers having a composition selected to provide emission of electromagnetic radiation at a predetermined fundamental-wavelength between about 425 nanometers and 1800 nanometers when optical-pump light is incident on said gain-structure;

a laser-resonator formed by said mirror-structure of said OPS-structure and at least two other reflectors, said laser resonator having a longitudinal axis;

an optical arrangement for delivering said pump-light to said gain-structure, thereby causing fundamental laser-radiation having said fundamental-wavelength to circulate in said laser-resonator;

a heat-sink arrangement for cooling said first OPS-structure;

a first optically-nonlinear crystal located in said laser-resonator and arranged for frequency-doubling said fundamental laser-radiation, thereby providing frequency-doubled radiation having a wavelength half of said fundamental wavelength;

a second optically-nonlinear crystal located in said laser-resonator an arranged for mixing said frequency-doubled radiation and said fundamental laser-radiation thereby providing frequency-tripled radiation having a wavelength one-third of said fundamental-wavelength; and

said laser-resonator, said optically nonlinear-crystal, said OPS-structure, said heat-sink arrangement and said optical pump-light-delivering arrangement selected and arranged such that said resonator delivers said frequency-tripled radiation as output-radiation having a wavelength between about 142 nanometers and 600 nanometers.

65. (new) A laser, comprising:

a first OPS-structure having a gain-structure surmounting a mirror-structure, said gain-structure including a plurality of active layers having pump-light-absorbing layers therebetween, said active layers having a composition selected to provide emission of electromagnetic radiation at a predetermined fundamental-wavelength between about 425

nanometers and 1800 nanometers when optical-pump light is incident on said gain-structure;

a laser-resonator formed by said mirror-structure of said first OPS-structure and at least two other reflectors;

an optical arrangement for delivering said pump-light to said gain-structure, thereby causing fundamental laser-radiation having said fundamental-wavelength to circulate in said laser-resonator;

a heat-sink arrangement for cooling said first OPS-structure; and

at least a first optically-nonlinear crystal located in said laser-resonator and arranged for frequency-doubling said fundamental laser-radiation.

66. (new) The laser of claim 65, wherein said laser resonator is formed by said mirror structure of said first OPS-structure and three other reflectors.

67. (new) The laser of claim 66, further including a second OPS-structure having a gain-structure surmounting a mirror-structure, and wherein said mirror structure of said second OPS-structure is one of said three other reflectors.

68. (new) The laser of claim 65, including a second optically nonlinear crystal arrange to mix frequency-doubled radiation provided by said first optically nonlinear crystal with said fundamental radiation thereby providing frequency tripled radiation.

69. (new) The laser of claim 65, including a second optically nonlinear crystal double the frequency of frequency-doubled radiation provided by said first optically nonlinear crystal with said fundamental radiation thereby providing frequency tripled radiation.

70. (new) A method of selectively irradiating a material having a characteristic absorption band in a spectral region between about 425 and 1800 nm, the irradiation being for one or more of cutting, ablating, heating or photochemically altering the material, the method comprising the steps of:

(a) providing an OPS-laser, said OPS-laser including an OPS-structure having a gain-structure incorporated into a laser resonator, said gain structure including a plurality of active layers having separator layers therebetween, said active layers having a composition selected to provide generation by said laser resonator of fundamental laser-radiation having a wavelength which is within the characteristic absorption band of the material when optical-pump light is delivered to said gain-structure;

(b) coupling fundamental radiation out of said OPS laser as output-radiation having a power greater than 2 Watts; and

(c) delivering said output-radiation to the material.

71. (new) The method of claim 70, wherein said output radiation is delivered via at least one of a lightguide, an articulated arm, and an optical-focusing system.

72. (new) The method of claim 70, wherein said output-radiation coupled out of the laser is a single axial-mode.